AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): An expander used in a refrigeration cycle using carbon dioxide as refrigerant and having a compressor, an outdoor heat exchanger and an indoor heat exchanger, wherein said expander comprises a cylindrical cylinder, a rotor which rotates in said cylinder, a vane which divides an expansion space formed between an inner peripheral surface of said cylinder and an outer peripheral surface of said rotor into a plurality of spaces, and a vane groove provided in said rotor for accommodating said vane therein, and wherein said vane groove is provided with a back pressure chamber which pushes said vane against the inner peripheral surface of said cylinder, and said refrigerant in the supercritical state is introduced into said back pressure chamber, wherein the expander is lubricated by oil mist discharged from the compressor.

Claim 2 (original): An expander according to claim 1, further comprising a suction pipe which introduces refrigerant into said expansion space, wherein a portion of refrigerant flowing through said suction pipe is introduced into said back pressure chamber.

Claim 3 (original): An expander according to claim 1, wherein no oil reservoir is provided in a hausing which includes said cylinder or said rotor therein.

Claim 4 (currently amended): A refrigeration cycle apparatus having a refrigeration cycle using carbon dioxide as refrigerant and having a compressor, an outdoor heat exchanger, an expander and an indoor heat exchanger, said refrigeration cycle apparatus including, in said refrigeration cycle, a first four-way valve to which a discharge side pipe and a suction side pipe of said compressor are connected, and a second four-way valve to which a refrigerant-inflow side pipe and a refrigerant-outflow side pipe of said expander are connected, wherein using, as said expander, a sliding vane type expander having a cylindrical cylinder, a rotor which rotates in said cylinder, a vane which divides an expansion space formed between an inner peripheral surface of said cylinder and an outer peripheral surface of said rotor into a plurality of spaces, and a vane groove provided in said rotor for accommodating said vane therein, refrigerant flowing through a pipe extending from said second four-way valve to a refrigerant-inflow port of said expander is introduced into a back surface of said vane, wherein the expander is lubricated by oil mist discharged from the compressor.

Claim 5 (currently amended): A refrigeration cycle apparatus having a refrigeration cycle using carbon dioxide as refrigerant and having a compressor, an outdoor heat exchanger, an expander and an indoor heat exchanger, said refrigeration cycle apparatus including, in said refrigeration cycle,

a first four-way valve to which a discharge side pipe and a suction side pipe of said compressor are connected, and a second four-way valve to which a refrigerant-inflow side pipe and a refrigerant-outflow side pipe of said expander are connected, wherein using, as said expander, a sliding vane type expander having a cylindrical cylinder, a rotor which rotates in said cylinder, a vane which divides an expansion space formed between an inner peripheral surface of said cylinder and an outer peripheral surface of said rotor into a plurality of spaces, and a vane groove provided in said rotor for accommodating said vane therein, refrigerant flowing through a pipe extending from a discharge port of said compressor to said first four-way valve is introduced into a back surface of said vane, wherein the expander is lubricated by oil mist discharged from the compressor.

Claim 6 (canceled).

Claim 7 (currently amended): A compressor used in a refrigeration cycle using carbon dioxide as refrigerant and having an outdoor heat exchanger and an indoor heat exchanger and an expander, wherein said compressor comprises a cylindrical cylinder, a rotor which rotates in said cylinder, a vane which divides a compression space formed between an inner peripheral surface of said cylinder and an outer peripheral surface of said rotor into a plurality of spaces, and a vane groove provided in said rotor for accommodating said vane therein, and wherein said vane groove is provided with a back pressure chamber which pushes said vane against the inner peripheral surface

of said cylinder, and said refrigerant in the supercritical state is introduced into said back pressure chamber, wherein the expander is lubricated by oil mist discharged from the compressor.

Claim 8 (original): A compressor according to claim 7, further comprising a discharge pipe which discharges refrigerant from said compression space, wherein a portion of refrigerant flowing through said discharge pipe is introduced into said back pressure chamber.